Date: Thu, 17 Mar 94 04:30:51 PST
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>
Errors-To: Ham-Homebrew-Errors@UCSD.Edu
Reply-To: Ham-Homebrew@UCSD.Edu
Precedence: Bulk
Subject: Ham-Homebrew Digest V94 #64
To: Ham-Homebrew

Ham-Homebrew Digest Thu, 17 Mar 94 Volume 94 : Issue 64

Today's Topics:

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

Date: Wed, 16 Mar 1994 06:43:43 GMT
From: ihnp4.ucsd.edu!mvb.saic.com!MathWorks.Com!news.kei.com!ub!
galileo.cc.rochester.edu!ee.rochester.edu!rbc!al@network.ucsd.edu
Subject: ACS (Al's Circuit Simulator) version 0.13 is available
To: ham-homebrew@ucsd.edu

A new version of ACS (Al's Circuit Simulator) has been posted to
alt.sources. It is also available by ftp from cs.rit.edu or
ee.rochester.edu. (in pub/acs). If you don't have net access you
can get it by dial-up from (USA) 716-272-1645.

ACS is a general purpose mixed analog and digital circuit simulator.
It performs nonlinear dc and transient analyses, fourier analysis,
and ac analysis linearized at an operating point. At this point
the analog is stronger than the digital. (In fact, the digital
part is rather weak.) It is fully interactive and command driven.
It can also be run in batch mode or as a server. The output is
produced as it simulates. Spice compatible models for the MOSFET

(level 1 and 2) and diode are included in this release.

This version (0.13) includes several improvements including real Fourier analysis and better time step control based on truncation error. There are other minor improvements.

Since it is fully interactive, it is possible to make changes and re-simulate quickly. The interactive design makes it well suited to the typical iterative design process used it optimizing a circuit design. It is also well suited to undergraduate teaching where Spice in batch mode can be quite intimidating. This version, while still officially in beta test, should be stable enough for basic undergraduate teaching and courses in MOS design, but not for bipolar design.

In batch mode it is mostly Spice compatible, so it is often possible to use the same file for both ACS and Spice.

The analog simulation is based on traditional nodal analysis with iteration by Newton's method and LU decomposition. An event queue and incremental matrix update speed up the solution for large circuits.

It also has digital devices for true mixed mode simulation. The digital devices may be implemented as either analog subcircuits or as true digital models. The simulator will automatically determine which to use. Networks of digital devices are simulated as digital, with no conversions to analog between gates. This results in digital circuits being simulated faster than on a typical analog simulator, even with behavioral models. The digital mode is experimental and needs work. There will be substantial improvements in future releases.

ACS also has a simple behavioral modeling language that allows simple behavioral descriptions of most components including capacitors and inductors. Unfortunately, it is not well documented.

ACS uses an object oriented approach to modeling. Complex models like MOSFETS are made of simpler ones like resistors, capacitors, diodes, and any other models that may already exist. The model designer does not need to worry about details like convergence checking, bypass checking, integration, or how the new device plugs into the solution matrix because these are already taken care of by the basic models. This results in a dramatic improvement in the time it takes a researcher or model designer to install a new model, compared to Spice.

The source and documentation can be obtained by anonymous ftp from

ee.rochester.edu or cs.rit.edu in /pub/acs. It can also be obtained by dial-up (USA) 716-272-1645 in /pub/acs. It may be distributed under the terms of the GNU general public license. The dial-up also has some test circuits, pre-compiled executables for Next, Sun4, MSDOS and possibly others, and documentation in dvi and postscript.

If you are tired of Spice and want a second opinion, you want to play with the circuit and want a simulator that is interactive, or you want to study the source code and want something easier to follow than Spice, try ACS.

ACS is an ongoing research project. It is being released in a preliminary phase in hopes that it will be useful and that others will use it as a thrust or base for their research. I also hope for some comments that may help me direct my research.

Albert Davis, 136 Doncaster Rd., Rochester, NY 14623.
email: atd@cs.rit.edu or davis@ee.rochester.edu
fax: 716-272-1645

Date: Wed, 16 Mar 1994 00:51:08 GMT
From: world!profesor@uunet.uu.net
Subject: Capacitor code (NOT color code)
To: ham-homebrew@ucsd.edu

cravitma@cps.msu.edu (Matthew B Cravit) writes:

>Someone help!

>I obtained a pack of about 500 disc capacitors, and they are all
>labelled with a code which I do not understand and have not found any
>reference for so far (ARRL handbook etc). For example, what _looks_
>like a .1 uF capacitor is labelled "102Z".

(from pages 70-73 of "Electronic Components: A complete Reference for Project Builders", by Delton T. Horn)

It appears to be a 3-digit code, where the first two digits are the two significant digits, and the third digit is a multiplier digit. Usually this is in picofarads, so your capacitor is a 100 pF or a .1uF capacitor, as you guessed.

>BTW, I assume this is _not_ the tolerance coding, since there is only
>one line of this stuff and no other values printed on the capacitor.

Funny you should ask, page 73 there is a table, and 'Z' stands for a
+80%/-20% tolerance rating.

I don;t know much about electronics myself, but this is such a cool
book, I had to use it for something :-)

     -Matt

Date: Wed, 16 Mar 1994 15:49:53 GMT
From: spsgate!mogate!newsgate!dtsdev0!kinzer@uunet.uu.net
Subject: Capacitor code (NOT color code)
To: ham-homebrew@ucsd.edu

profesor@world.std.com writes:
>
>> For example, what _looks_
>>like a .1 uF capacitor is labelled "102Z".
>
>It appears to be a 3-digit code, where the first two digits are the
>two significant digits, and the third digit is a multiplier digit.
>Usually this is in picofarads, so your capacitor is a 100 pF or a .1uF
>capacitor, as you guessed.
>

There are at least two errors in the preceeding paragraph. Finding
them is left as an exercise for the student.

-dave

Date: Wed, 16 Mar 1994 13:26:05 GMT
From: ihnp4.ucsd.edu!swrinde!cs.utexas.edu!howland.reston.ans.net!EU.net!sunic!
psinntp!psinntp!arrl.org!zlau@network.ucsd.edu
Subject: Capacitor code (NOT color code)
To: ham-homebrew@ucsd.edu

Matthew B Cravit (cravitma@cps.msu.edu) wrote:
: Someone help!

: I obtained a pack of about 500 disc capacitors, and they are all
: labelled with a code which I do not understand and have not found any
: reference for so far (ARRL handbook etc). For example, what _looks_
: like a .1 uF capacitor is labelled "102Z".

I found an explanation of this code on page 35-2 of the 1994

ARRL Handbook. 102Z is a 1000pF capacitor with a tolerance
of -20 to +80 %.

--
Zack Lau KH6CP/1   2 way QRP WAS
                           8 States on 10 GHz
Internet: zlau@arrl.org   10 grids on 2304 MHz

Date: 16 Mar 1994 01:44:44 GMT
From: ihnp4.ucsd.edu!agate!howland.reston.ans.net!wupost!bigfoot.wustl.edu!cec1!
mne1@network.ucsd.edu
Subject: DDS Projects
To: ham-homebrew@ucsd.edu

Hi. I just got the March 1994 issue of 73, and I read an article on a
digital front panel for the TW-1 (Techno-Whizzy).

Apparently the TW-1 was a DDS VFO which was published in the December 1992
issue of 73.

I would really appreciate it if somebody would send me a xerox copy of
the article as I am interested in building it.   I am also interested in
any other DDS projects that anyone else has come across, like the "Julieboard"
from 73 last summer.

oes anyone have any experience with these or other DDS projects?

thanks
mne1@cec.wustl.edu

Matthew Ettus
6515 Wydown Box 3451
St. Louis, MO 63105
(314) 935-1511
I will reimburse copying and postage costs
thanks

Date: Wed, 16 Mar 1994 16:49:02 GMT
From: ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!howland.reston.ans.net!
europa.eng.gtefsd.com!emory!wa4mei!ke4zv!gary@network.ucsd.edu
Subject: DMM help!
To: ham-homebrew@ucsd.edu

In article <2m4qrd$bk9@news.ysu.edu> ak238@yfn.ysu.edu (Keith M. Hamilton) writes:
>
>I am going to be purchasing a DMM at dDayton this year. I would
>like to hear from someone who has had good liuck with a certain
>meter or perhaps someone who wishes they had bought a certain
>meter.
>I am a relative beginner to building and testing circuits and
>components and I would like to buy the best meter for the
>money.

Well the best DMMs say "Fluke" on them, but the best DMMs
for the money usually have some Tiawanese scrawl on them. :-)
You don't really care if you drop a $19 meter, or blow it up
trying to measure across the mains on the ohms scale. Blowing
up or damaging a Fluke is harder, but not that much harder.

For typical ham applications, you don't need NIST traceable
accuracy, or more than 3 digits precision. What you need is
a large display, and enough guts to withstand being dropped.
And the capability to work in a high RF field. This latter
is important, and even some expensive meters fail. If you see
a meter operating at Dayton without varying wildly, it'll
probably work for your ham use. Meters that have an analog
bargraph in the display are also incredibly helpful. Choose
one with this feature if you can. A lot of the time you're
interested in seeing the *change* in a signal rather than
its absolute value. The bargraph, like an analog needle meter,
makes this much easier than watching a blur of digits.

PS, don't neglect a good Simpson 260 analog meter. They're
great, and many experienced techs would feel lost without
one. Watching the meter ballistics can tell you more about
a circuit under test than 18 whirring digits on a DMM.

Gary
--

Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

Date: 16 Mar 1994 18:25:49 GMT
From: news.cerf.net!pravda.sdsc.edu!acsc.com!wp-sp.nba.trw.com!elroy.jpl.nasa.gov!
swrinde!cs.utexas.edu!howland.reston.ans.net!usenet.ins.cwru.edu!lerc.nasa.gov!
news.larc.@@ihnp4.ucsd.edu

Subject: DMM help!
To: ham-homebrew@ucsd.edu

In article <1994Mar16.164902.15539@ke4zv.atl.ga.us> gary@ke4zv.atl.ga.us (Gary Coffman) writes:
>
>Well the best DMMs say "Fluke" on them, but the best DMMs
>*for the money* usually have some Tiawanese scrawl on them. :-)
>You don't really care if you drop a $19 meter, or blow it up
>trying to measure across the mains on the ohms scale. Blowing
>up or damaging a Fluke is harder, but not that much harder.

I have a cheap Taiwanese meter... it's actually a beast resold by B&K precision.

It's not as well-constructed as a Fluke, but it's still extremely rugged. The problem that I have with it is that the last digit displayed isn't reliable... compared with an extremely accurate HP reference, it may be off by a significant amount on the last place.

However, the continuity tester is _much_ louder than the one on the Flukes. This is a big deal for me, working in environments that aren't always quiet. It might be a major disadvantage for you, though.

The capacitance tester isn't as accurate as my old ZM-11/U, but it's still pretty good, and it's quite handy when working in environments where carrying the Z-meter would be a bit difficult. However, it doesn't always detect high ESR, though it's usually good about leakage.

The transistor tester is worthless.

>For typical ham applications, you don't need NIST traceable
>accuracy, or more than 3 digits precision. What you need is
>a large display, and enough guts to withstand being dropped.
>*And* the capability to work in a high RF field. This latter
>is important, and even some expensive meters fail. If you see
>a meter operating at Dayton without varying wildly, it'll
>probably work for your ham use. Meters that have an analog
>bargraph in the display are also incredibly helpful. Choose
>one with this feature if you can. A lot of the time you're
>interested in seeing the *change* in a signal rather than
>its absolute value. The bargraph, like an analog needle meter,
>makes this much easier than watching a blur of digits.

Actually, the analogue bargraphs drive me up the wall. That's why I have an old Simpson 260 sitting on the shelf next to my DMM. It comes in handy very frequently when dealing with rapidly changing signals. I second the recommendation for an analogue meter on the side...

--scott

--
"C'est un Nagra. C'est suisse, et tres, tres precis."

Date: 16 Mar 1994 20:31:23 GMT
From: ihnp4.ucsd.edu!swrinde!emory!europa.eng.gtefsd.com!howland.reston.ans.net!wupost!news.miami.edu!usenet.ufl.edu!usenet.cis.ufl.edu!bennett@network.ucsd.edu
Subject: DMM help!
To: ham-homebrew@ucsd.edu

If I may also add some advice. I have found that both the DMM type meters that you asked about, and analog meters, such as the Simpson Mr. Coffman mentioned are highly useful. I have both analog and digital meters and use both.
Paul Bennett
N4EGO

Date: Wed, 16 Mar 1994 20:21:16 GMT
From: ihnp4.ucsd.edu!swrinde!cs.utexas.edu!convex!news.ssc.gov!fnnews.fnal.gov!att-in!cbnewsm!hellman@network.ucsd.edu
Subject: DMM help!
To: ham-homebrew@ucsd.edu

In article <1994Mar15.200831.10419@exu.ericsson.se>, exualan@exu.ericsson.se (Alan Malkiel) writes:
> I'll second the Fluke recommendation. Mine is 12 years old and
> I would love to upgrade, but the !?##*&! thing won't break no matter
> how badly I treat it.
>
> ---
> Alan, KE5JL
>

Same problem here. mine's easily a dozen years old and is as good as day one.
BUT, the Fluke model 85 in the lab broke (the display contacts went bad)!
Current price for a 77 better be well under $100, or buy the HP DMM (list $99).

Shel Darack WA2UBK

Date: Wed, 16 Mar 1994 04:39:37 GMT
From: ihnp4.ucsd.edu!library.ucla.edu!europa.eng.gtefsd.com!howland.reston.ans.net!wupost!csus.edu!netcom.com!tgm@network.ucsd.edu

Subject: Meter Shunts, etc
To: ham-homebrew@ucsd.edu

Doug Snowden (drs@ccd.harris.com) wrote:
: I know I can figure out the resistance of a foot of # xx wire
: for a shunt. Also, I haven't found any sort of chart that has the resistance
: of wire.

The ARRL handbook has a wire table in it somewhere (at least older
handbooks did, I don't know about the most recent). Look in the
data section of the handbook (or check the index).

Thomas KI4N

Date: Wed, 16 Mar 1994 20:33:41 GMT
From: ihnp4.ucsd.edu!library.ucla.edu!europa.eng.gtefsd.com!
howland.reston.ans.net!wupost!gumby!newsxfer.itd.umich.edu!ncar!csn!col.hp.com!
srgenprp!alanb@network.ucsd.edu
Subject: Meter Shunts, etc
To: ham-homebrew@ucsd.edu

Thomas G. McWilliams (tgm@netcom.com) wrote:
: Doug Snowden (drs@ccd.harris.com) wrote:
: : I know I can figure out the resistance of a foot of # xx wire
: : for a shunt. Also, I haven't found any sort of chart that has the resistance
: : of wire.

: The ARRL handbook has a wire table in it somewhere (at least older
: handbooks did, I don't know about the most recent). Look in the
: data section of the handbook (or check the index).

Be aware that copper has a strong temperature coefficient (about 0.4%
per degree C), so a meter shunt made of copper wire will not be
accurate over a wide temperature range.

They make special 4-leaded, low-resistance resistors especially for
meter shunts (don't ask me where to buy them!) Another trick is to use
a higher-value shunt resistor and then add resistance in series with the
meter to get it to read the correct value. Of course, that has the
disadvantage of a larger voltage drop.

AL N1AL

Date: Wed, 16 Mar 1994 20:42:44 GMT

From: ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!howland.reston.ans.net!cs.utexas.edu!
convex!news.ssc.gov!fnnews.fnal.gov!att-in!cbnewsm!hellman@network.ucsd.edu
To: ham-homebrew@ucsd.edu

References <2m332n$l53@msuinfo.cl.msu.edu>, <CMqFp9.7qt@world.std.com>,
<1994Mar16.154953.4547@newsgate.sps.mot.com>sc.gov
Subject : Re: Capacitor code (NOT color code)

In article <1994Mar16.154953.4547@newsgate.sps.mot.com>,
kinzer@dtsdev0.sps.mot.com (Dave Kinzer) writes:
> profesor@world.std.com writes:
> >
> >> For example, what _looks_
> >>like a .1 uF capacitor is labelled "102Z".
> >
> >It appears to be a 3-digit code, where the first two digits are the
> >two significant digits, and the third digit is a multiplier digit.
> >Usually this is in picofarads, so your capacitor is a 100 pF or a .1uF
> >capacitor, as you guessed.
> >
>
> There are at least two errors in the preceeding paragraph. Finding
> them is left as an exercise for the student.
>
> -dave

ppphewww! glad you posted and saved me the trouble of correcting that one.
(pssst! milli,micro,nano,pico,femto,....   10 00 pico=.001 uF)
Shel Darack WA2UBK

Date: 16 Mar 1994 23:16:41 GMT
From: ihnp4.ucsd.edu!agate!msuinfo!cravitma@network.ucsd.edu
To: ham-homebrew@ucsd.edu

References <CMqFp9.7qt@world.std.com>,
<1994Mar16.154953.4547@newsgate.sps.mot.com>, <CMryvG.2tw@cbnewsm.cb.att.com>
Subject : Re: Capacitor code (NOT color code)

Many thanks to everyone who replied to my question about the color
code. Now, does anyone know of a relatively easy-to-build something to
allow my Fluke 77 to measure capacitance? (Or is there a way to make
it do that without an accessory? Or does Fluke sell such an accessory?
Or is this even possible?)

Thanks again.

/Matthew

--
Matthew Cravit, N9VWG | All opinions expressed here are
Michigan State University | my own. I don't speak for MSU
E-Mail: cravitma@cps.msu.ed | and they don't speak for me.
GO/CS -d+@ -p+ c++ !l u+(++) e+(*) s/+ n+(---) h+ f+ !g w+(+++) t++@ r(+) y?

End of Ham-Homebrew Digest V94 #64
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